#3

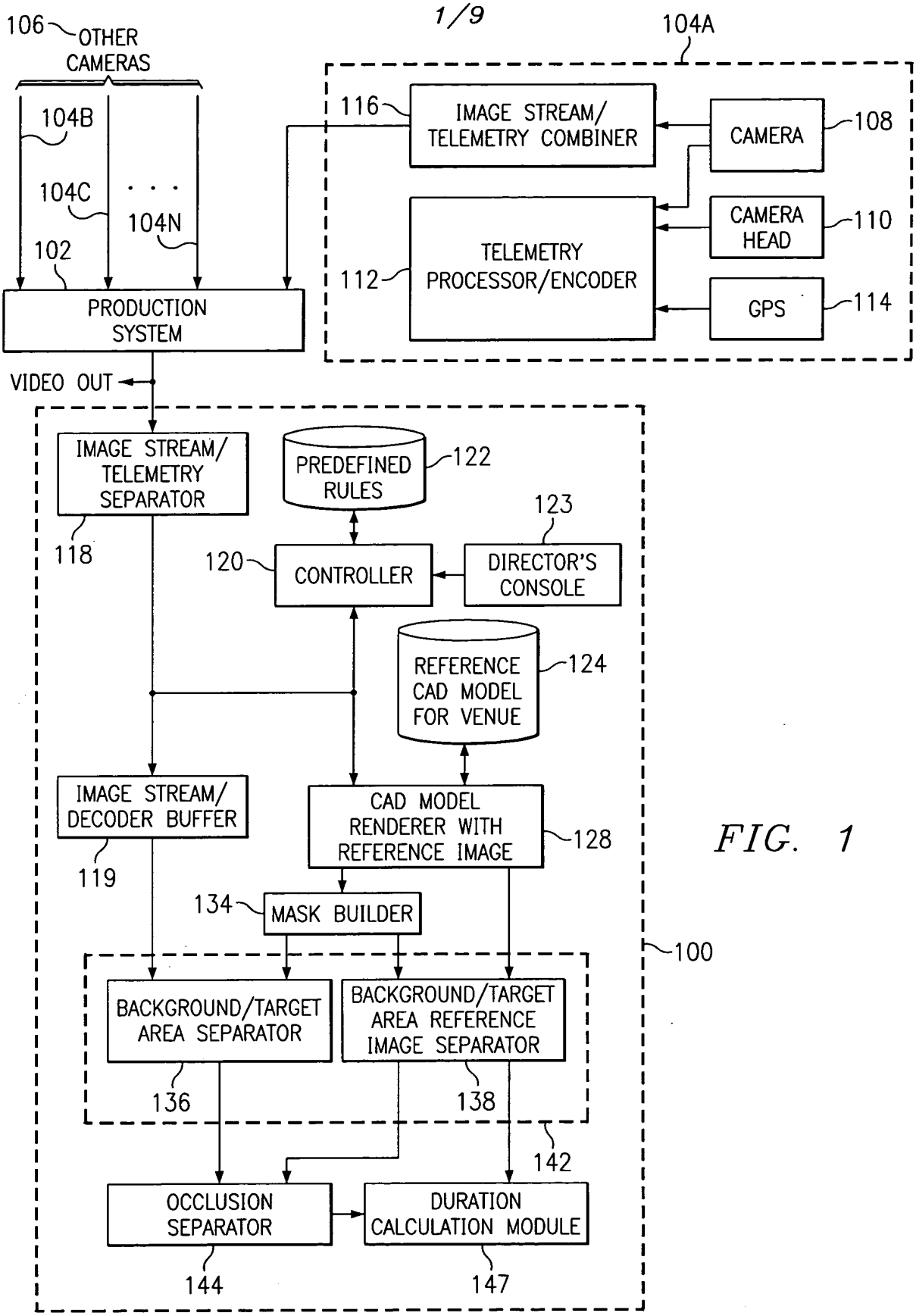

106
OTHER CAMERAS
104B
104C
104N
102
PRODUCTION SYSTEM
104A
116
IMAGE STREAM/ TELEMETRY COMBINER
CAMERA
108
CAMERA HEAD
110
TELEMETRY PROCESSOR/ENCODER
112
GPS
114
VIDEO OUT
IMAGE STREAM/ TELEMETRY SEPARATOR
118
PREDEFINED RULES
122
123
120
CONTROLLER
DIRECTOR'S CONSOLE
REFERENCE CAD MODEL FOR VENUE
124
IMAGE STREAM/ DECODER BUFFER
119
CAD MODEL RENDERER WITH REFERENCE IMAGE
128
134
MASK BUILDER
100
BACKGROUND/TARGET AREA SEPARATOR
BACKGROUND/TARGET AREA REFERENCE IMAGE SEPARATOR
136
138
142
OCCLUSION SEPARATOR
DURATION CALCULATION MODULE
144
147

FIG. 1

FIG. 2

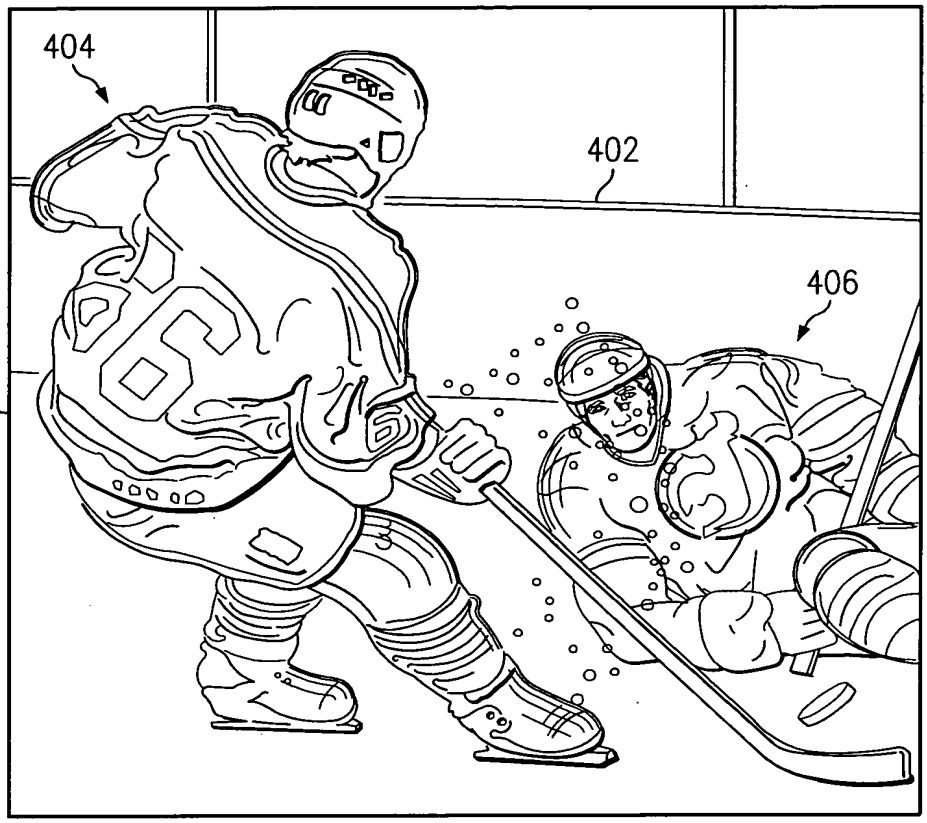


FIG. 3

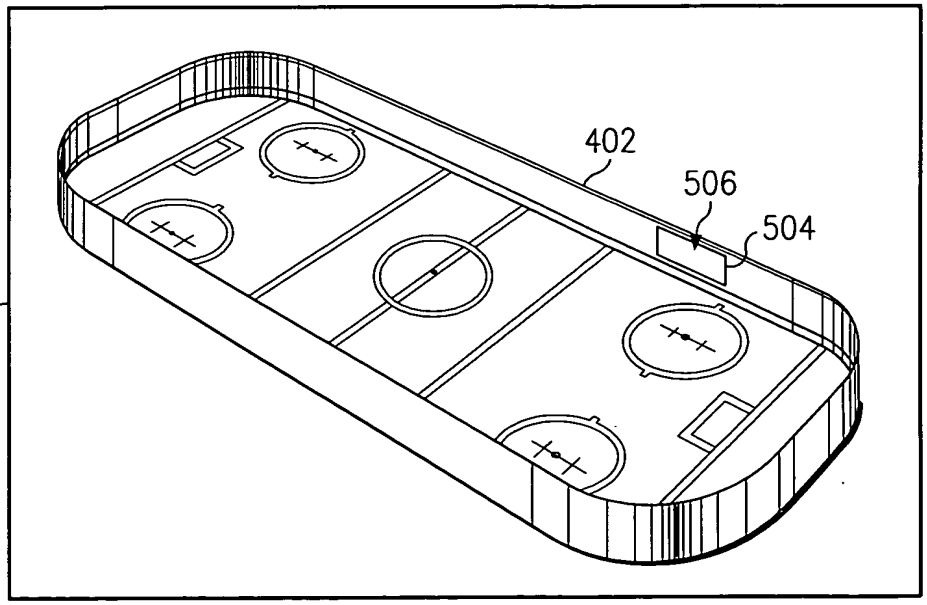


FIG. 4

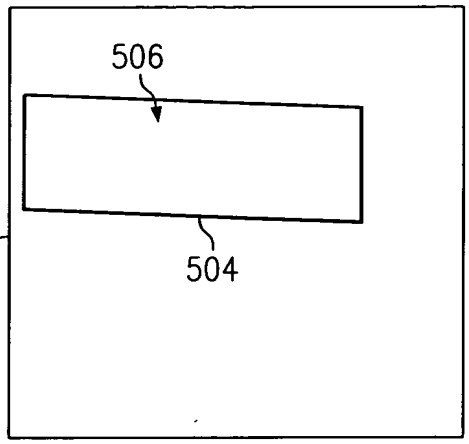


FIG. 5

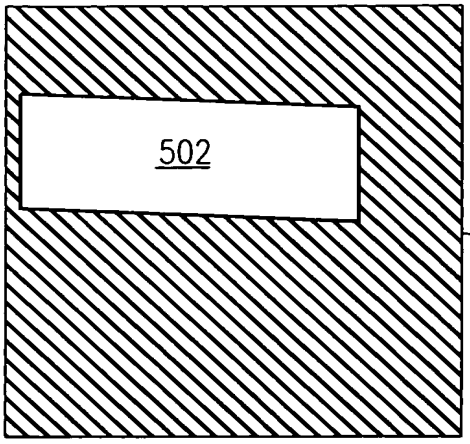


FIG. 6

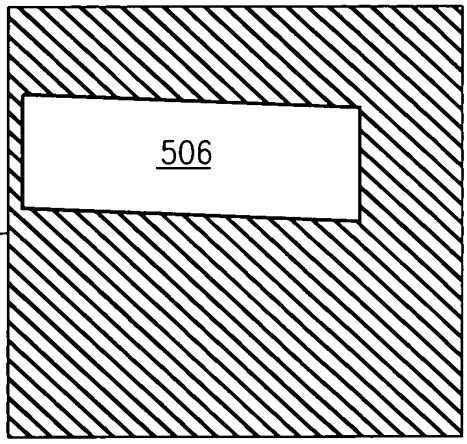


FIG. 7

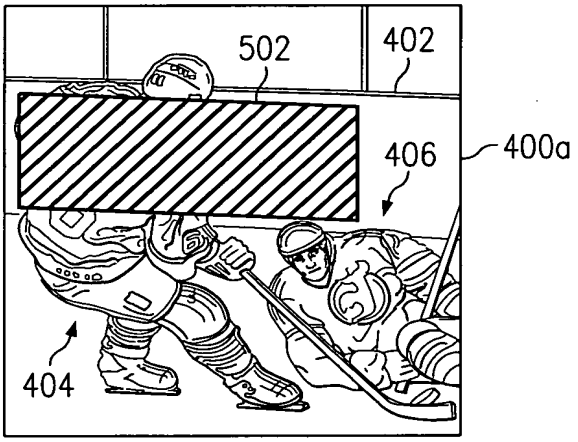


FIG. 8

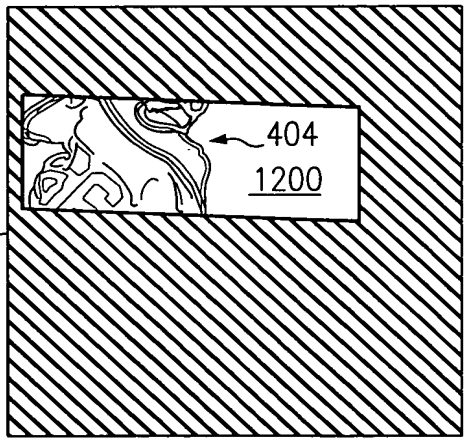


FIG. 9

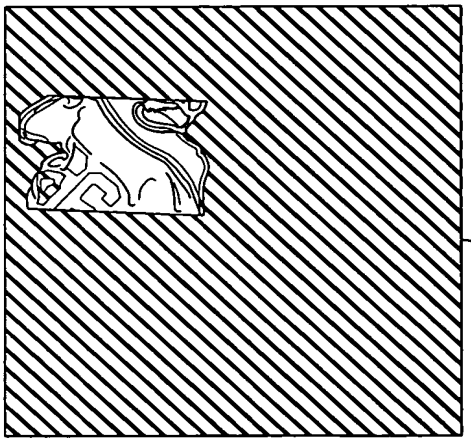


FIG. 10

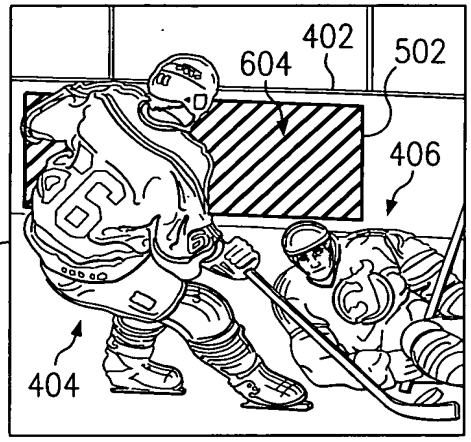

402
604
502
406
400e
404

FIG. 11

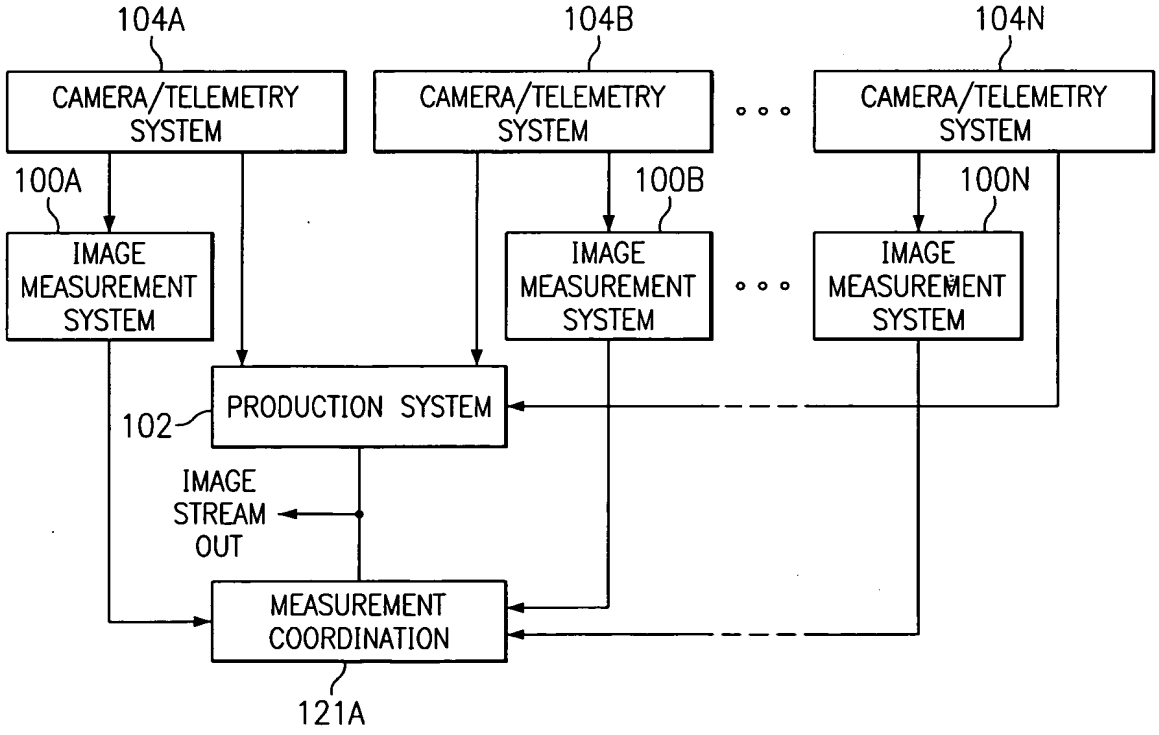

104A
104B
104N
CAMERA/TELEMETRY SYSTEM
CAMERA/TELEMETRY SYSTEM
CAMERA/TELEMETRY SYSTEM
100A
100B
100N
IMAGE MEASUREMENT SYSTEM
IMAGE MEASUREMENT SYSTEM
IMAGE MEASUREMENT SYSTEM
102
PRODUCTION SYSTEM
IMAGE STREAM OUT
MEASUREMENT COORDINATION
121A

FIG. 12

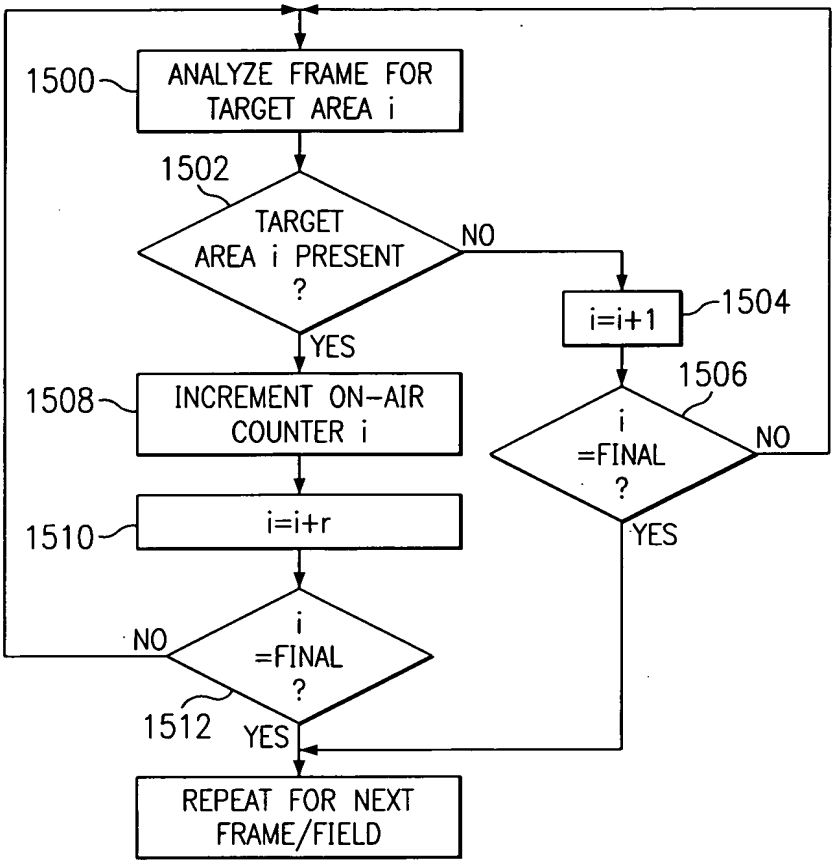

1500
ANALYZE FRAME FOR TARGET AREA i
1502
TARGET AREA i PRESENT ?
NO
YES
1504
i=i+1
1506
i =FINAL ?
NO
YES
1508
INCREMENT ON-AIR COUNTER i
1510
i=i+r
i =FINAL ?
NO
1512
YES
REPEAT FOR NEXT FRAME/FIELD

FIG. 13

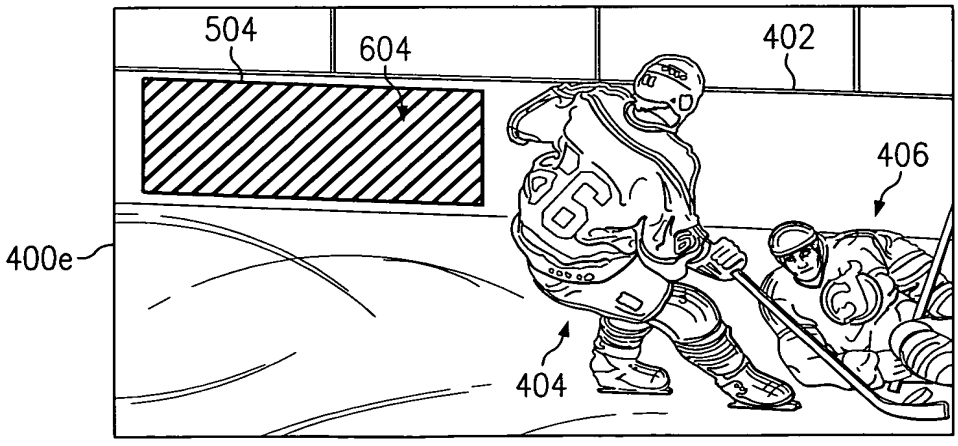

504
604
402
406
400e
404

FIG. 14

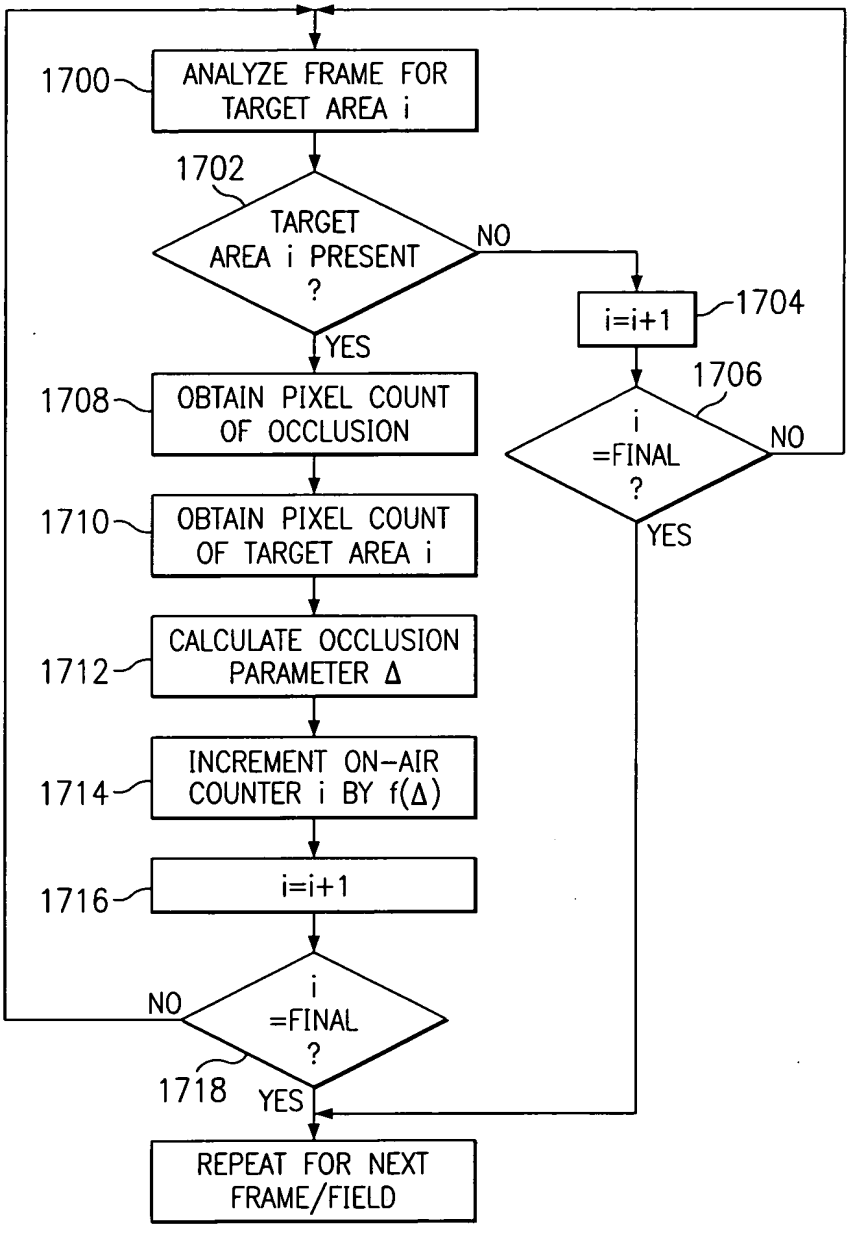

1700
ANALYZE FRAME FOR TARGET AREA i
1702
TARGET AREA i PRESENT ?
NO
YES
1704
i=i+1
1706
i =FINAL ?
NO
YES
1708
OBTAIN PIXEL COUNT OF OCCLUSION
1710
OBTAIN PIXEL COUNT OF TARGET AREA i
1712
CALCULATE OCCLUSION PARAMETER Δ
1714
INCREMENT ON-AIR COUNTER i BY f(Δ)
1716
i=i+1
i =FINAL ?
NO
1718
YES
REPEAT FOR NEXT FRAME/FIELD

FIG. 15A

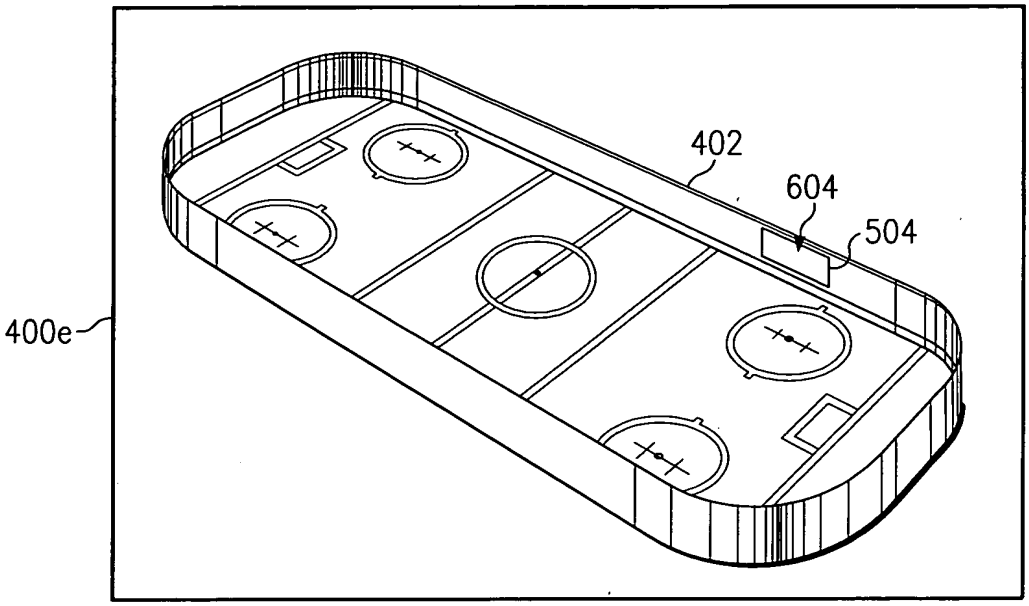


FIG. 15B

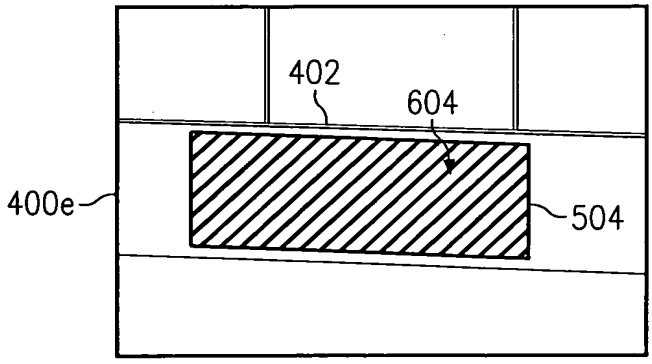


FIG. 16

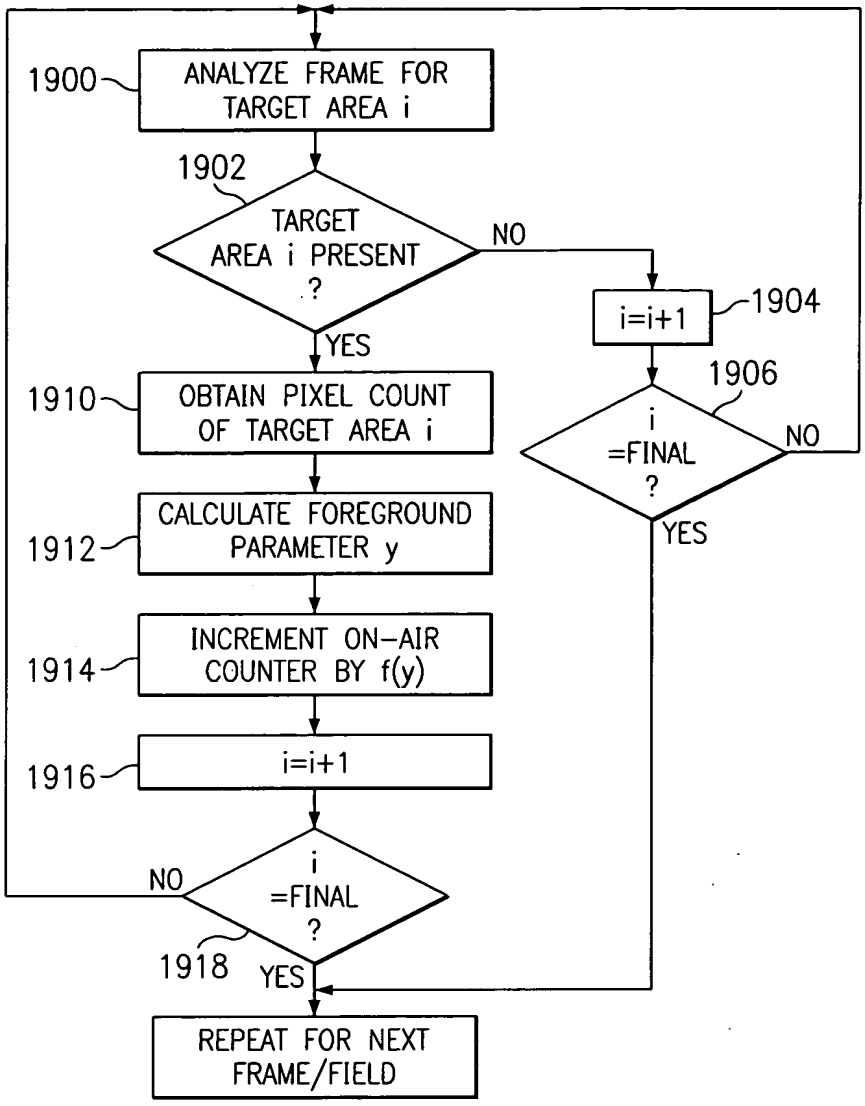
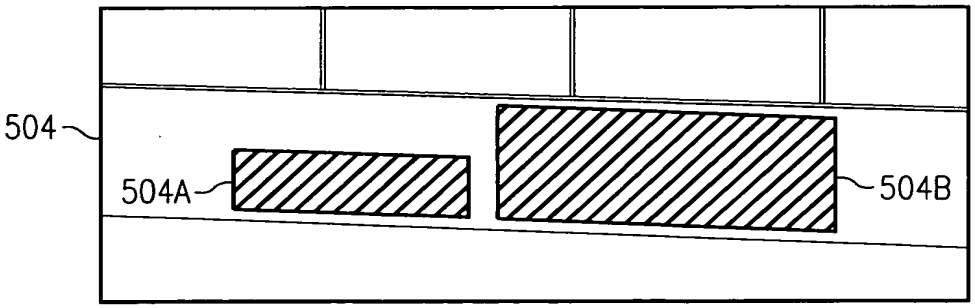

1900
ANALYZE FRAME FOR TARGET AREA i
1902
TARGET AREA i PRESENT ?
NO
YES
1904
i=i+1
1906
i =FINAL ?
NO
YES
1910
OBTAIN PIXEL COUNT OF TARGET AREA i
1912
CALCULATE FOREGROUND PARAMETER y
1914
INCREMENT ON-AIR COUNTER BY f(y)
1916
i=i+1
i =FINAL ?
NO
1918
YES
REPEAT FOR NEXT FRAME/FIELD

FIG. 17


504
504A
504B

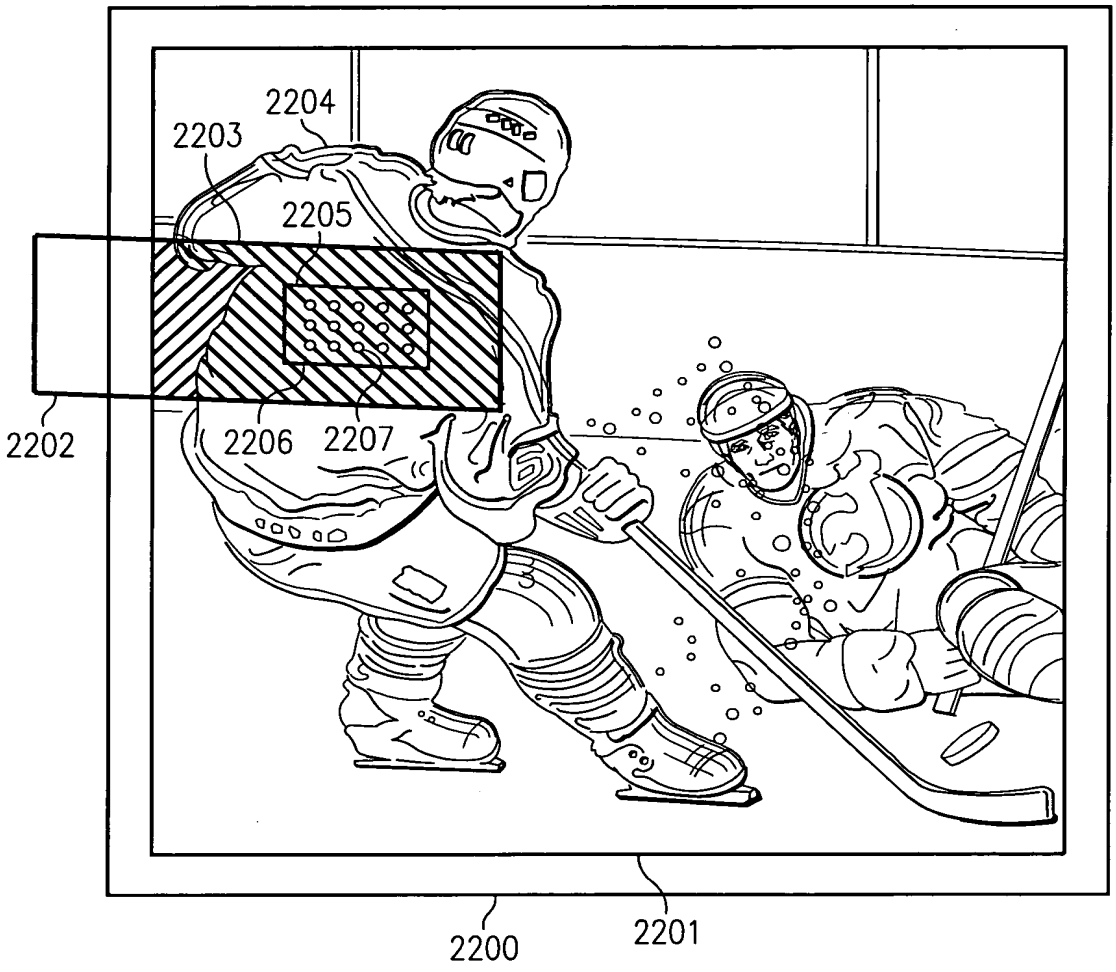



FIG. 18